

5

Claims

1. Micro-mechanical device comprising at least one suspended element (1) attached to a support (3) by a pillar (2) comprising a base (4) and a top (5), the support (3) comprising a cavity (6) etched in a substrate and opening out at the surface of the substrate facing the suspended element (1), the cavity (6) having at least one broader zone having a cross-section which is greater than the cross-section of the cavity (6) at said surface, the base (4) of the pillar (2), of complementary shape to the cavity (6), being buried in the cavity (6), device characterized in that at least two broader zones of the cavity (6) are formed by at least two superposed grooves (19), the base (4) of the pillar (2) comprising at least two ribs (20) complementary to said grooves.

2. Device according to claim 1, characterized in that the top (5) of the pillar (2) is buried in a complementary first cavity (7) of the suspended element (1), the top (5) of the pillar (2) comprising a zone of broader cross-section in the first cavity (7) of the suspended element (1).

3. Device according to claim 2, characterized in that the top (5) of the pillar (2) and the first cavity (7) of the suspended element (1) form a dovetail assembly.

4. Device according to any one of the claims 1 to 3, characterized in that it comprises a cover (14) integral to an additional pillar (15), a base (16) of the additional pillar (15), opposite the cover (14), being buried in a complementary second cavity (17) of the suspended element (1), the base (16) of the additional

30

pillar (15) comprising a zone of broader cross-section in the second cavity (17) of the suspended element (1).

5. Device according to claim 4, characterized in that the base of the additional pillar (15) and the second cavity (17) of the suspended element (1) form a dovetail assembly.

10. 6. Device according to either one of the claims 4 and 5, characterized in that it comprises an electrically insulating layer (18) arranged at the interface between the suspended element (1) and the additional pillar (15).

7. Production method of a micro-mechanical device according to any one of the claims 1 to 6, characterized in that it comprises:

- deposition of at least one sacrificial layer (8) on a surface of the support (3),
- etching, in the sacrificial layer (8), of a hole (11) passing through the sacrificial layer (8) and reaching the surface of the support (3),
- etching of the support (3), in the extension of the hole (11), so as to form the cavity (6) of the support (3), said grooves (19) being achieved by alternation of a passivation step by C_4F_8 and an etching step by SF_6 plasma,
- deposition of a material designed to form the pillar (2) in the cavity (6) of the support (3) and at least on the walls of the hole (11).

20. 8. Method according to claim 7, characterized in that it comprises:

- before etching of the hole (11), deposition of a solid layer (9) and of an additional sacrificial layer (10) on the sacrificial layer (8),
- etching of the hole (11) being performed in the stacking formed by the additional sacrificial layer (10), the solid layer (9) and the sacrificial layer (8), the hole (11) comprising a broader zone in the additional sacrificial layer (10),

- elimination of the additional sacrificial layer (10) after deposition of the material (12) designed to form the pillar (2),
- deposition of a material (13) forming the suspended element (1) on the solid layer (9) and the material (12) forming the pillar (2),
5 - elimination of the sacrificial layer (8).

9. Method according to claim 8, characterized in that it comprises:

- etching of the suspended element (1) so as to form a dovetail-shaped second cavity (17) in the suspended element (1),
- deposition in the second cavity (17) of the suspended element (1) of a material designed to form the base (16) of an additional pillar (15) integral to a cover (14).

10. Method according to any one of the claims 7 to 9, characterized in that the

15 material (12) designed to form the pillar (2) is deposited in such a way as to fill the hole (11).